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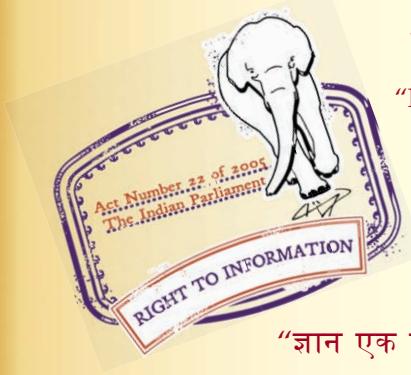
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IS 4087 (1980): Pipette for Haemoglobinometers and Blood Pipette for Biochemical Work [MHD 10: Medical Laboratory Instruments]

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“Knowledge is such a treasure which cannot be stolen”





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*Indian Standard*

SPECIFICATION FOR  
PIPETTE FOR HAEMOGLOBINOMETERS AND  
BLOOD PIPETTE FOR BIOCHEMICAL WORK

( *First Revision* )

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INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

# Indian Standard

## SPECIFICATION FOR

### PIPETTE FOR HAEMOGLOBINOMETERS AND

### BLOOD PIPETTE FOR BIOCHEMICAL WORK

### ( First Revision )

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# *Indian Standard*

## SPECIFICATION FOR

### PIPETTE FOR HAEMOGLOBINOMETERS AND BLOOD PIPETTE FOR BIOCHEMICAL WORK

( *First Revision* )

## 0. FOREWORD

**0.1** This Indian Standard ( First Revision ) was adopted by the Indian Standards Institution on 26 September 1980, after the draft finalized by the Medical Glass Instruments and Appliances Sectional Committee had been approved by the Consumer Products Division Council.

**0.2** Preparation of standards for surgical instruments, medical equipment and apparatus, including medical glass instruments, has been taken up at the instance of the Advisory Committee for Development of Medical Instruments, Equipment and Appliances ( Government of India ).

**0.3** In this revision the test for permanency of marking has been modified to bring it in line with the provisions of other standards on similar medical glass instruments.

**0.4** In the preparation of this standard, assistance has been derived from IND/SL/MED/5892 ' Haemometer pipette, capillary, 0.02 ml ' published by the Ministry of Defence, Government of India.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

## 1. SCOPE

**1.1** This standard covers the requirements and methods of test for pipette for haemoglobinometer used in pathological work and blood pipette for biochemical work.

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\*Rules for rounding off numerical values ( *revised* ).

## 2. MATERIAL

**2.1** The pipettes shall be made from heat-resistance glass tubing or lead glass tubing, clear or with enamel back ( for definitions, see IS : 1382-1961\* ). The tubes shall have a uniform bore.

**2.2** The mouthpiece shall be made of glass or plastics.

**2.3** The connecting tube shall be of rubber or polyethylene tubing, non-collapsible under suction by mouth.

## 3. SHAPE, DIMENSIONS AND CAPACITY

**3.1** The shape and dimensions of the pipettes shall be as given in Fig. 1, 2 and 3.

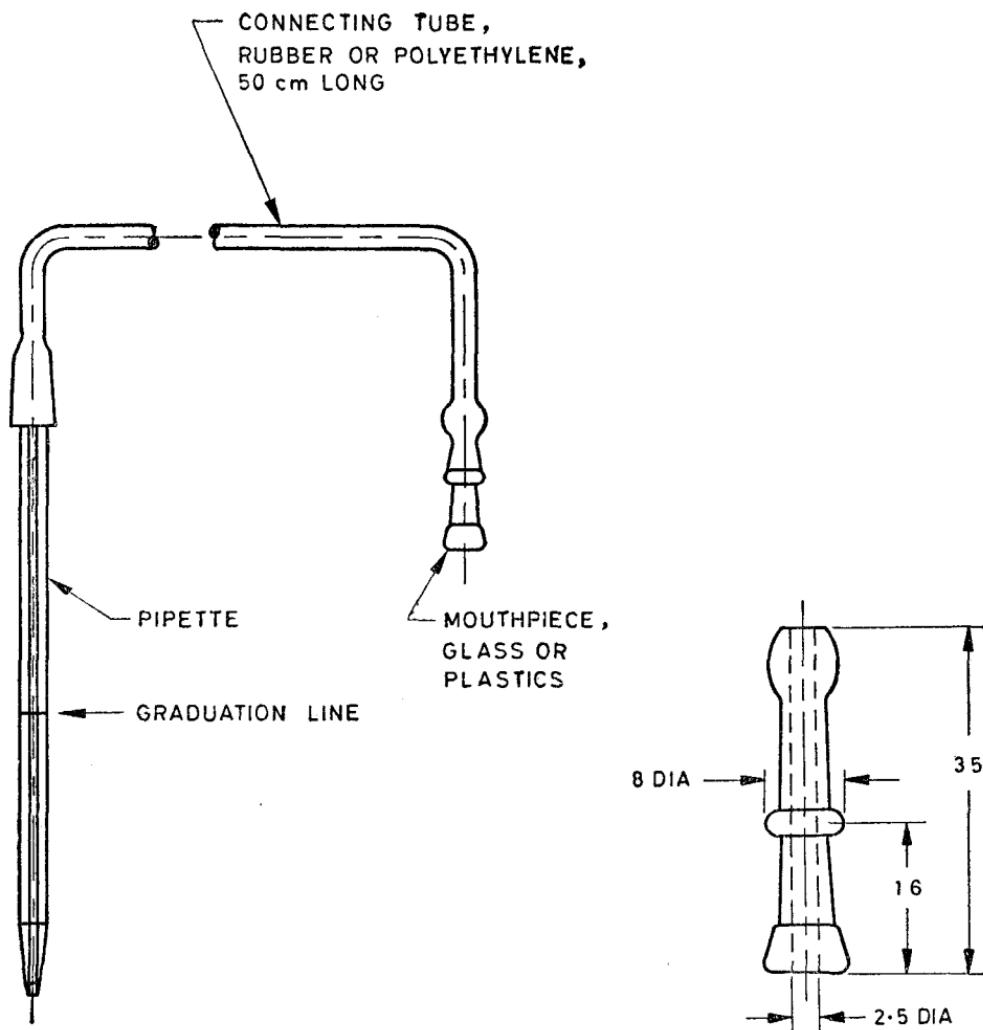
**3.2** The pipette for haemoglobinometer shall be calibrated to contain  $20 \mu\text{l}$  up to the mark etched on it, at  $27^\circ\text{C}$ . The blood pipette shall be calibrated to contain  $200 \mu\text{l}$  at  $27^\circ\text{C}$ .

**3.3** The capacity of the pipette for haemoglobinometer at  $27^\circ\text{C}$  up to the mark shall be  $20 \pm 5 \mu\text{l}$  and that of the blood pipette at  $27^\circ\text{C}$  shall be  $200 \pm 5 \mu\text{l}$  up to the mark on it, when tested in accordance with the method specified in 6.1.

## 4. WORKMANSHIP AND FINISH

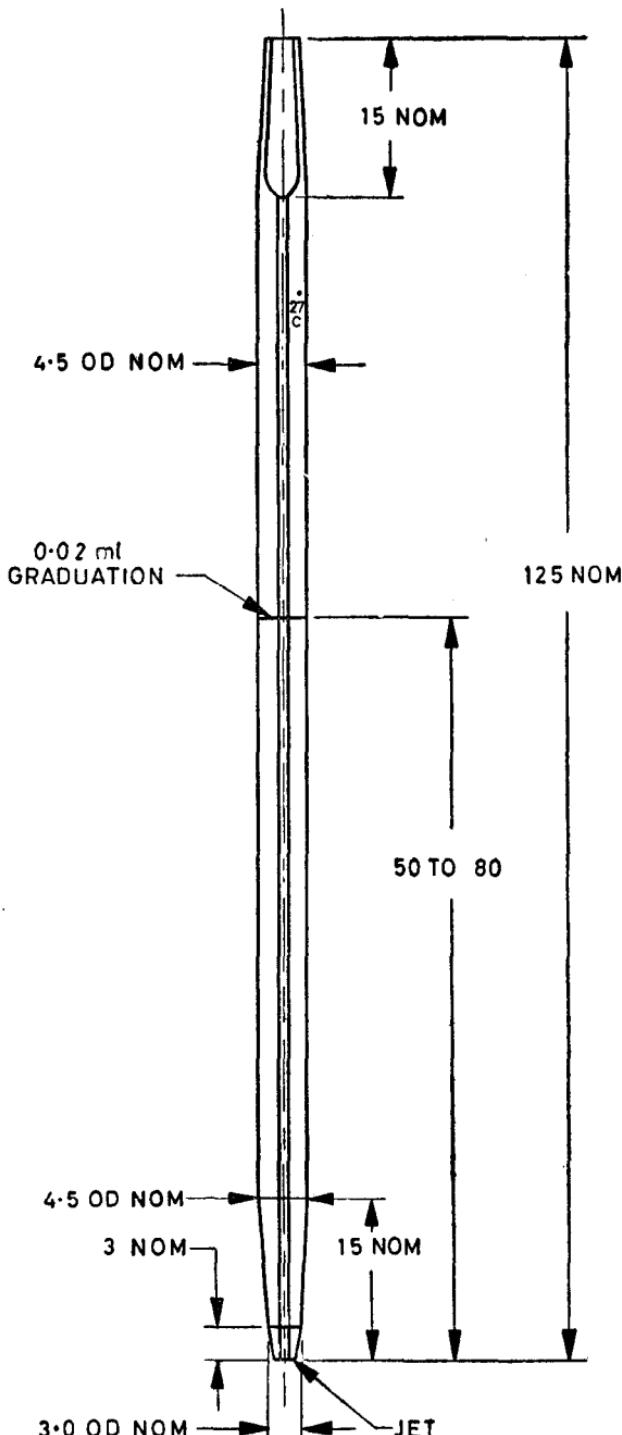
**4.1** The pipette shall be well-annealed and free from bubbles, blisters and as far as possible, from striae, stones and other visible defects ( for definitions, see IS : 1382-1961\* ). It shall be symmetrical about its axis. The bore of the pipette shall be uniform throughout. The capillary at the upper end of the pipette for haemoglobinometer may be expanded as shown in Fig. 2 or it may consist entirely of capillary bore. The top of the pipette shall be smooth and finished at right angles to the axis. The top 10 to 20 mm of the pipette may taper slightly to facilitate the attachment of a rubber tubing. The jet of the haemoglobinometer pipette shall be formed by grinding into a taper as shown in Fig. 2. The delivery jet of the blood pipette shall be made with a gradual taper. There shall be no sudden constriction of the bore at the orifice. The tapered portion shall be polished. The end of the jet shall be ground smooth and at right angles to the axis of the pipette. The jet of the blood pipette shall be bevelled slightly at the periphery. The pipette shall pass the thermal shock test specified in 6.2.

\*Glossary of terms relating to glass industry.



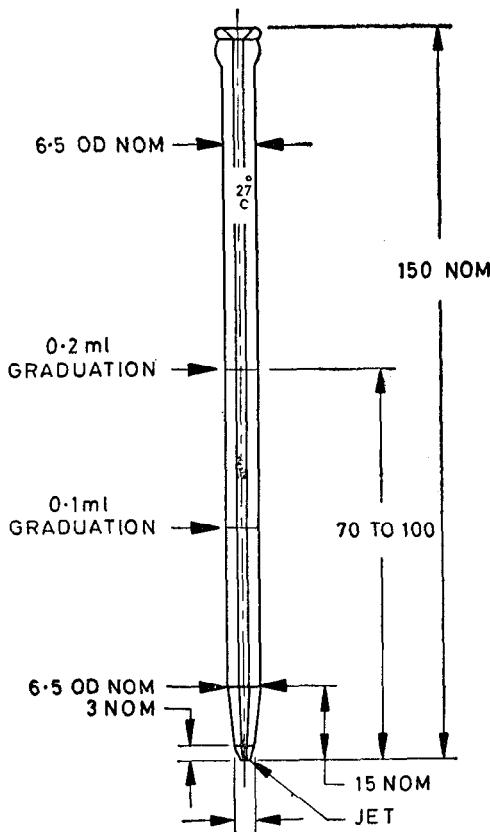
All dimensions in millimetres.

FIG. 1 ASSEMBLY FOR HAEMOGLOBINOMETER PIPETTE AND PIPETTE FOR BLOOD BIOCHEMICAL WORK WITH DETAILS OF MOUTHPIECE



All dimensions in millimetres.

FIG. 2 PIPETTE, HAEMOGLOBINOMETER



All dimensions in millimetres.

FIG. 3 BLOOD PIPETTE FOR BIOCHEMICAL WORK

## 5. GRADUATIONS

5.1 The graduation lines shall be fine, clean, permanent and of uniform thickness and at right angles to the axis of the pipette. They shall be carried all round the circumference of the pipette. On the haemoglobinometer pipette the mark  $20 \mu\text{l}$  shall be inscribed immediately above or below the line and shall be permanent. The blood pipette shall be marked at  $100 \mu\text{l}$  and  $200 \mu\text{l}$ , inscribed immediately above the respective line. When tested according to 6.3, there shall be no fading of the graduation lines or marks.

## 6. TESTS

**6.1 Method for Determination of Capacity** — The pipette shall be cleaned thoroughly and dried in an air oven maintained at  $110 \pm 5^{\circ}\text{C}$ . It shall be cooled in a desiccator. The connecting tube and mouthpiece shall be attached. Mercury shall be sucked in and its level adjusted up to the graduation mark to be tested. This mercury shall be transferred into a clean and dry, previously massed, beaker or any other vessel and massed. The volume at  $27^{\circ}\text{C}$  shall be calculated from the mass of the mercury determined.

**6.2 Thermal Shock Test** — The pipette shall be boiled for 30 minutes and plunged into water at about  $20^{\circ}\text{C}$ . It shall show no chipping or cracking.

**6.3 Test for Permanency of Marking** — The pipette shall be completely immersed in a glass cylinder containing hydrochloric acid solution in distilled water of 0.01 normality. The cylinder and its contents shall be autoclaved at  $98.1 \text{ kN/m}^2$  at  $120^{\circ}\text{C}$  for 30 minutes. The autoclaving shall be repeated after allowing sufficient time for the cylinder and contents to come to room temperature. The markings shall not show appreciable reduction in intensity.

## 7. MARKING

**7.1** The pipette shall be marked with the following:

- a) Name of the manufacturer;
- b) Symbol '27°C' to indicate that the pipette is calibrated at  $27^{\circ}\text{C}$ ;  
and
- c) The word 'In', to indicate that it is calibrated to contain the liquid.

**7.1.1** Each pipette may also be marked with the ISI Certification Mark.

**NOTE** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licency for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## 8. PACKING

**8.1** The pipette may be packed as given in **8.1.1** or as agreed between the supplier and the purchaser.

**8.1.1** The pipette shall be clipped on to a suitable cardboard piece, either by self-clipping action on the cardboard or by a separate clip or rubber band. One pipette so mounted shall be packed in a cardboard carton along with the connecting tube and the mouth piece, both attached, and placed in a paper envelope. In case the connecting tube is of rubber, it shall be given suitable sprinkle of French chalk.

# INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

## Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

## Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

## Derived Units

Quantity	Unit	Symbol	Definition
Force	newton	N	1 N = 1 kg.m/s <sup>2</sup>
Energy	Joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m <sup>2</sup>
Frequency	hertz	Hz	1 Hz = 1 c/s (s <sup>-1</sup> )
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m <sup>2</sup>

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